

Digital Imaging: theory joins practice.

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Introduction

It is no secret that digital presentation of collection items is a necessary and highly valued goal of cultural heritage institutions. Digitized materials aid researchers, educate life-long learners and promote the depth and breadth of libraries, archives and museums. Institutions of all types now find themselves creating and providing electronic access to scores of their collection items. This growing body of shared resources, sometimes referred to as the *knowledge commons*, has become an invaluable tool for 21st century learners. However, unless everyone contributing to the knowledge commons is producing quality, accessible and preservable products, the success and utility of the commons is greatly compromised. In this paper we will introduce two resources that will assist librarians, archivists and museum staff in creating quality digital objects: the BCR's CDP Digital Imaging Best Practices, Version 2.0 and the Art Institute of Chicago (AIC) Rapid Imaging Project project documentation.

Libraries, archives and museums have been providing assistance to users of their visual collections for hundreds of years. Independently, they have worked toward the shared goal of providing quality resource descriptions to accompany their visual collections. However, over the past several years, the landscape has changed and cultural heritage institutions now find themselves addressing new and similar challenges: to increase their end-user access by allowing efficient online retrieval of their digital content and to enhance the research and learning opportunities of their institutions. To do this, the cultural heritage community must collectively create standardized and accessible images as well as standardized and descriptive catalogue records which, when combined, will result in useable/searchable collections available through the knowledge commons.

The new landscape encourages, if not demands, collaborative activities not only to bring together content through the development of varied and comprehensive digital collections but also as a solution to the lack of resources - funding, staff, space, equipment - necessary to bring these collections to life. The new landscape looks to digital photography and sophisticated copying capabilities to capture the versatile collections found in our institutions. And, because of the quantity and large file sizes of digital image files and the associated metadata, immediate and long-term storage concerns are great. And these concerns have led us directly to our collective interest in digital preservation.

As representatives from cultural heritage institutions, we find ourselves looking to each other for new ways to address these growing concerns and challenges. Libraries have a long history of working in consortia to standardize resource description across institutions. Museums bring a commitment to the accurate visual representation of cultural artifacts resulting in high-quality image capture standards. We would like to suggest that the bringing together of these two respected resources on digital imaging provides a comprehensive yet practical solution to creating high quality, sustainable digital images.

Version 2.0 of the *CDP Digital Imaging Best Practices*, published in 2008 by BCR's CDP, draws on the expertise of working group members and digital colleagues to address the evolving imaging needs of beginning imaging practitioners from cultural heritage institutions. When CDP decided to put together a working group to revise the Imaging Best Practices, each member was selected carefully. The group needed to represent institution types throughout the cultural heritage sector so it could speak to the needs and concerns of its broad-ranging audience. Rather than provide procedural information and specialized workflows, Version 2.0 introduces readers to the theory behind accepted best practices. Discussions of equipment selection, digital photography, image quality and storage and preservation issues have been included in this latest version to keep practitioners abreast of current options and recommendations. Drawing from a variety of resources at AIC, including conservation staff, collection managers, curators and digital imaging specialists, the Rapid Imaging Project (RIP) has established a

practical digital imaging workflow solution in order to present "discovery images" of the permanent collection on the museum's webpage. This workflow solution is being followed to facilitate the rapid image capture necessary to digitize a collection of over 250,000 museum objects. The project takes into consideration the diversity of objects at the museum and through its focus on cost efficiency and productivity, has created a flexible workflow that can be easily integrated into smaller institutions.

The benefits of merging the collective expertise of the cultural heritage community are many. By adhering to shared technical and descriptive practices it becomes possible to exchange information among databases and across networks. By following common approaches and workflows developed by experts in the field, all institutions, regardless of size or type, can contribute to and take advantage of the knowledge commons. Both the CDP Imaging Best Practices and the Art Institute's RIP project documentation provide clear, concise information. By combining these two important resources, imaging practitioners have a practical and robust resource to introduce them to the goals, challenges and desired outcomes of contributing digital content and a clear and concise guide to the successful creation of quality digital content.

The CDP Digital Imaging Best Practices, Version 2.0

The CDP Digital Imaging Best Practices document is considered a guide for image capture, presentation and storage. The best practices have been determined, collectively, by experts and practitioners from across the field and are developed and maintained in order to encourage a consistent level of image quality across collections. The document is revised regularly due to the consistent and ongoing changes to the technology and industry standards and is a guide the digitization of text, photographs, maps and graphic materials. Image practitioners new to the field would be served by sitting down with the Digital Imaging Best Practices and reading through it to gain a general understanding of the range of issues that need to be considered before beginning a digitization project. Some topics, such as project management, metadata creation and audio/video formats are not fully covered, however, they are introduced to readers and additional resources are recommended for further study. The CDP Imaging Best Practices

presents a holistic approach to project development and readers are encouraged to think through the different phases of the digitization process from the beginning: image creation and presentation, storage and digital preservation. The long-term sustainability of digital objects and collections is determined by a commitment to follow accepted best practices and standards.

The basics of image creation are covered here: modes of capture, resolution and bit depth. What does DPI mean? Is it the same as PPI? What is the difference? The Imaging Best Practices answers those questions and others you may have. Hardware and software considerations are covered along with the reasons why one should consider purchasing one piece of equipment over another.

The meat of the document is found in the section titled *Guidelines for Creating Digital Images*. Here you will find guidelines for creating master and derivative files, how to develop a file naming convention and why it is a critical piece of the digitization process. Guidelines for a variety of source types are included: film, graphics, text, 3-dimensional works, photographs and more. An image quality control program is discussed and encouraged with several things to look for when inspecting image files and recommendations on when to re-capture and when to provide corrections. The CDP Digital Imaging Best Practices gives beginning practitioners a comprehensive look at the different phases of a digitization project. Readers will become familiar with imaging terminology, will become aware of ongoing and evolving issues and, it is hoped, will adopt the expectation that, as potential contributors to the knowledge commons, all institutions need to follow accepted best practices in order to create high quality, sustainable digital images.

But, there is a caveat, regardless of one's level of confidence or knowledge of the subject. Given the tight budgets, minimal staffing and added responsibilities many of us in the cultural heritage community regularly face, the reality of creating an efficient and affordable imaging program can seem like an unattainable goal. Many institutions are asked begin digital projects without high-end imaging expertise, photography skills, workflow or metadata experience.

However, if we return to the benefits of collaboration discussed in the introduction of this paper, we see that it is critical that we look to our cultural heritage partners for assistance. The Art Institute of Chicago has photographic and imaging expertise and has used that expertise to document a complex digital imaging project and make that documentation accessible to colleagues throughout the cultural heritage sector. Through their work, there is now a template to follow which will allow institutions to create realistic, versatile and theoretically-sound imaging workflows.

Rapid Imaging Case Study at the Art Institute of Chicago

This section of the paper will illuminate the equipment and workflow currently in use in the Rapid Imaging Project at the Art Institute of Chicago. A quick overview of the project will allow one to grasp its basic purpose and function, while the sections on equipment and workflow will permit an in-depth understanding of the processes used to capture and distribute images at AIC. By reporting this process in specific detail, the Rapid Imaging Project can be seen as a case study and should be used as a resource by cultural heritage institutions in the beginning stages of their own digitization initiatives.

Overview of the Project

The Rapid Imaging Project (RIP) formally began in June of 2007 as a three year project in response to a mandate issued from the Art Institute of Chicago's (AIC) Director's office to have the museum's permanent collection quickly and comprehensively represented online, in accordance with reasonable publication standards for photography. Along with this mandate, RIP was developed to satisfy the large curatorial desire at AIC to easily access research images in the collection database, CITI (Chicago Images, Text and Indexing system), while providing a quick and effective way to capture images locally. The creation of these "discovery images" created for the collection's website (<http://www.artic.edu/aic/collections/>) provides the public with an in-depth look at AIC's encyclopedic collection. This project is currently housed in the Imaging Department. Taking advantage of the photography expertise in that department, the RIP structure is a result of collaboration between three diverse, yet relevant, experiences of three staff members at AIC. Sam Quigley's (Vice President of Collections Management and IT at

AIC) experience documenting the collection at Harvard University Art Museums brought valuable insight into establishing the goals and necessary outcomes for the digitization process. Chris Gallagher, the Associate Director of Imaging at AIC, emphasized the importance of consolidating the already established individual photography workstations in curatorial departments under one roof and embedding metadata into image files as they were captured. Chris' expertise in digital capture best practices as represented in the museum field provided key guidance in determining the standardizations the project should adhere to. Karin Patzke, as the project coordinator, implemented the workflow structure and documentation. Her previous experience as a curatorial departmental photographer brought a vital and unique understanding of the cataloging issues associated with carrying out a comprehensive digitization project. Pooling these staff resources allowed the RIP to set specific goals in terms of equipment quality, image usage, a timeline for the project, file accessibility, color correcting, archiving, file quotas, and transparency in the project.

The photographers, or technicians as they are called within the project, were pulled from collection management support positions, in the recognition that a photography background was not completely necessary for the project. Technicians would be working with a standardized workflow in consistent lighting conditions and would begin by photographing works on paper – relatively simple objects to photograph. Hiring staff fluent in the terms and issues of collection maintenance allowed the project to focus on digital capture with little worry from the curatorial departments about art handling issues. Training technicians to use the photography workstations required minimal training in comparison to the knowledge needed to understand collection issues that would inevitably turn up in such a thorough examination of storage locations. Three departments (Asian & Ancient, Photography and Prints & Drawings) were chosen to participate in the project based on the straightforward demands of photographing works on paper.

Establishing a quota of items to photograph on a daily was based on the previous results at the Prints and Drawings departmental photography workstation. This quota created a structure in which the images could be captured quickly and systematically through the methodical

photography of objects in the storage vaults. It also allowed a timeline to be projected on the project in anticipation of moving on to more difficult digitization, such as the photography of three-dimensional objects.

Equipment

The Rapid Imaging Project represents an expansion in image capture at the Art Institute of Chicago. Studio photography has traditionally been reserved for publications and exhibitions, which demand a large digital file for reproduction with the highest quality equipment in the Imaging Department. Recognizing the minimal requirements necessary for images on the web, as well as small image reproduction in catalogs, and taking into consideration the variety of objects at AIC, the RIP acquired cameras, lights, computers, and copy stands. The purchase of off-the-shelf applications helps to reduce costs and provide easy access to customer service help. High-end consumer cameras like the *Canon* Mark Series have allowed the capture large image files (approximately 25 megabytes) and the purchase of copy stands, tables, computers have created stations that are relatively mobile and simple to use (*Figure 1* illustrates the Asian and Ancient copy stand located in the main vault area).



Figure 1: Photo Station in Storage, Art Institute of Chicago

While the RIP began capturing images of works on paper the overarching plan was to eventually move on to three-dimensional photography. This knowledge allowed us to realize the purchase of cameras as opposed to scanners, which made the photography workstations more flexible to meet the demands of AIC's versatile collection. While scanners would allow the capture of very high quality images, not to mention Optical Character Recognition software available in corresponding bundled applications, for the specific needs of AIC (quick captures, versatile equipment and images suitable for web and small publications) purchasing cameras created workstations that could be easily adapted to a variety of collections within the institution.

The RIP at AIC is focused on maintaining digitization standards and meeting specific file quotas, while sustaining flexibility in an effort to accommodate photography requests quickly and professionally. Utilizing four stations, the Rapid Imaging Project responds quickly to requests for photography, in conjunction with the systematic photography of objects in storage locations.

Workflow

The workflow for the Rapid Imaging Project has been determined, in large part, by the outcomes and goals established at the onset of the project and secondly by equipment purchased. It is split into two parts: image capture performed by the photography technicians and archiving, conducted by the project manager.

Using the capture software available with the *Canon* cameras, the photography technicians begin the process of embedding metadata by entering a unique object identification number, specific to its cataloging record. While the image is captured as a proprietary Canon RAW file format it will be converted to the *Adobe* raw, .DNG, at a later stage. RAW files represent the original capture of the image file and can be easily accessed by Imaging color technicians for professional distribution for publication. Photographers also use the cataloging database, CITI, to keep track of specific information that will be embedded in the file, in the form of metadata, in a separate text document. (*Figure 2* documents the photographer's workflow.)

At the end of each photography session, the technicians give the RAW captures, the text document, along with a .TIF that has been cropped and minimally color corrected to the project coordinator. The coordinator then creates derivatives for distribution and uses the text document to import and embed metadata. The images are then moved and archived to a larger Imaging server. The RIP Archive is located on a server that is approximately four gigabytes. It is mirrored in a building across the street from the museum on a weekly basis by the Information Services department and backed up on tape as well.

Unique naming conventions along with the use of applications capable of extracting metadata help to avoid future confusion when multiple images are taken of a single object. Unique alphanumeric file names beginning with the main letters in a departmental name (“PH” for Photography, “PD” for Prints and Drawings, etc) also allow for a quick overall picture to develop in regards to the progress of each photographer and how they compare with each other. Using this information, the project coordinator can estimate how long the photography of a certain collection of objects might take as well as the type of equipment needed. Maintaining a consistent workflow, while using the terminology specific to curatorial departments in the metadata (for example, works on paper have a “recto” and “verso” while items such as coins have an “obverse” and “reverse”) allow for the archive to be easily managed and searched by those familiar with collections management. Unique file names also allow for the ability to update and change metadata easily and efficiently and can be considered one of the most important steps for image capture of this type.

The project coordinator carries out the goals established at the onset of the project by implementing a standardized workflow that all photographers follow. While the objects photographed are exceedingly diverse, the workflow helps to preserve consistency and productivity. The coordinator is also responsible for maintaining a daily progress report, tracking the number of images captured, as well as, notating specific cataloging and conservation issues that interrupt the fulfillment of the daily quota. In addition to these duties, the coordinator also organizes special projects and requests for the workstations. Correlating

these duties, the RIP has allowed AIC to capture 62,000 images, linked to 53,000 collection records in the span of only two years. (*Figure 3* documents the project coordinator's workflow.)

At AIC, this workflow is split into two steps (capturing and archiving) and between two people (the photographer and the coordinator) to maintain the quick capture of image files. But, if necessary these roles can be combined into one position, as long as a standard workflow is maintained and curatorial oversight is considered. The importance of transparency in documenting and distributing the workflow becomes vital so that one familiar with the collection can feel comfortable with the process of digital capture.

Conclusion

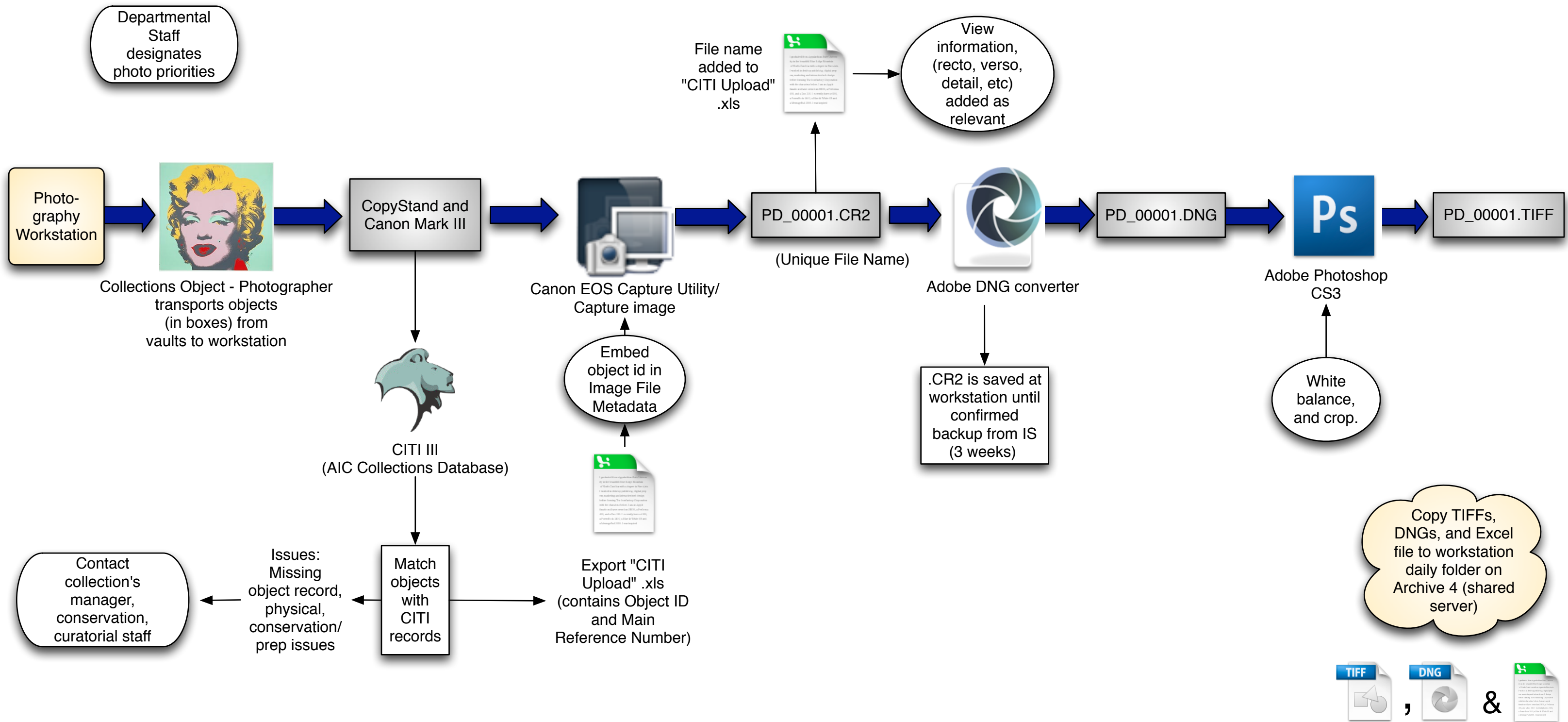
Regretfully, the Rapid Imaging Project at the Art Institute of Chicago will end August 1, 2009. While the results represent only the tip of the iceberg in a collection of over 250,000 objects, the legacy of this project, through clear and precise documentation of work flow and process, will allow the quick incorporation of digital photography, when timing and funding once again coalesce into the larger structure of collections archiving.

While the RIP at AIC fulfills the necessities of a large encyclopedic collection, the workflow documentation created is flexible enough to accommodate a variety of collections needs. The imaging equipment at AIC represents a higher level of consumer grade equipment, but the necessity for this equipment was determined by the goals, as well as the funding, for this specific project. With a limited budget, purchases can be made with minimal funds, yet the standardizations, as exemplified in the CDP Digital Imaging Best Practices Version 2.0, can be met with relative ease when a transparent workflow is distributed and followed. Equipment can be purchased either within the parameters of large goal driven projects, such as digitally documenting all of the objects in one collection, or adapted to specific special collections and smaller projects. These multiple tiers of equipment costs can be utilized effectively for many small institutions. At the end of this paper is a document that represents what a simplified workflow for a digitization process might look like. (*Figure 4.*)

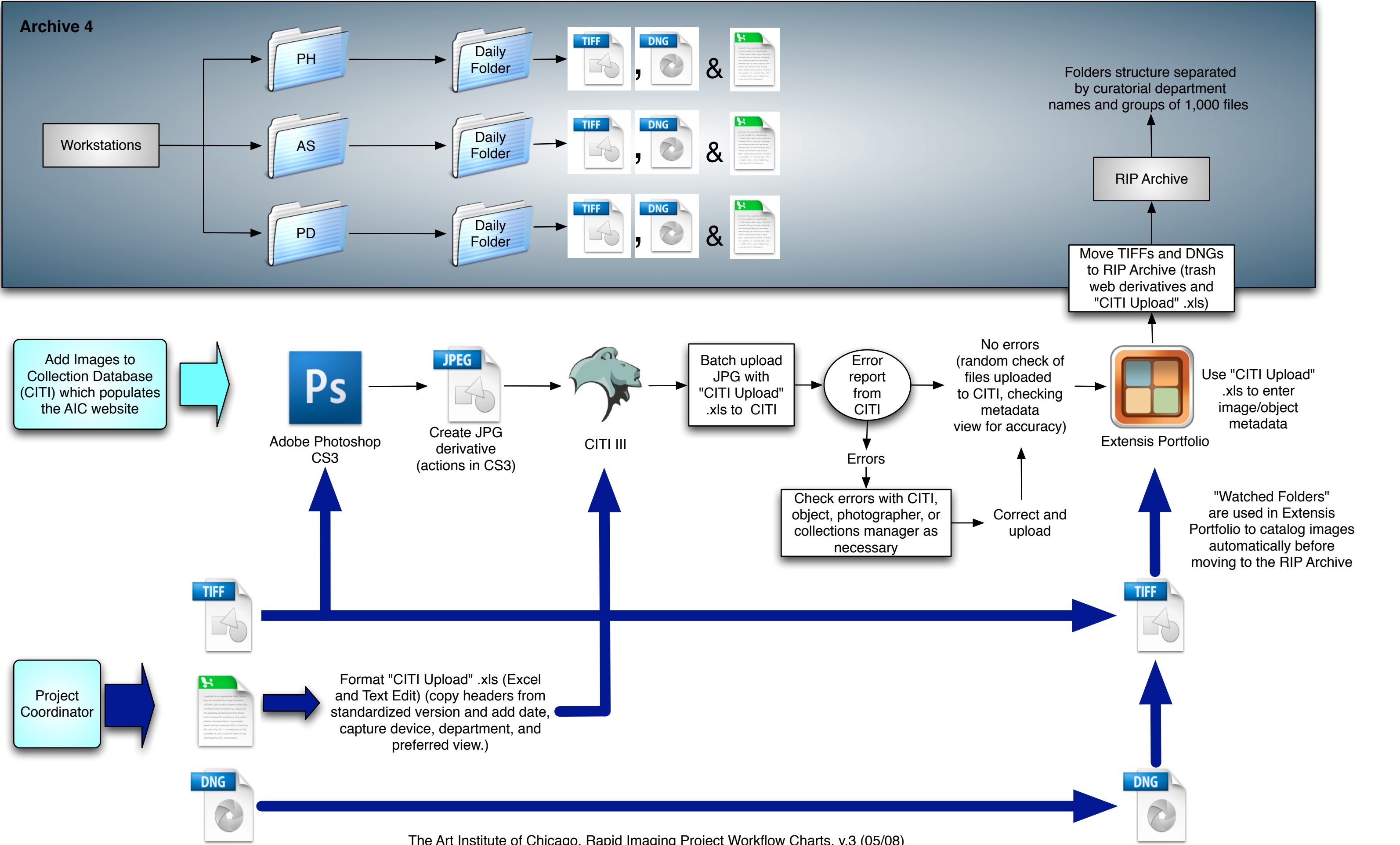
Best practices in regards to file size, image capture and archiving constitute essential factors

when planning a digitization project, but recognizing the flexibility in assessing equipment purchases and workflow documentation can help make a daunting digitization project seem much more feasible. Using the Imaging Best Practices as a guide for digital capture and theory and taking the RIP documentation as a starting point for workflow, as well as keeping in mind the evolution and adaptation of imaging workstations, can set in motion digital photography program that can grow as digitization takes hold in an organization. With the combined resources of the BCR CDP Digital Imaging Best Practices, Version 2.0 and the Art Institute of Chicago's Rapid Imaging Project workflow documentation, digitization within cultural heritage institutions can emerge successfully.

Rapid Imaging Project: Simplified Work Station Workflow Chart



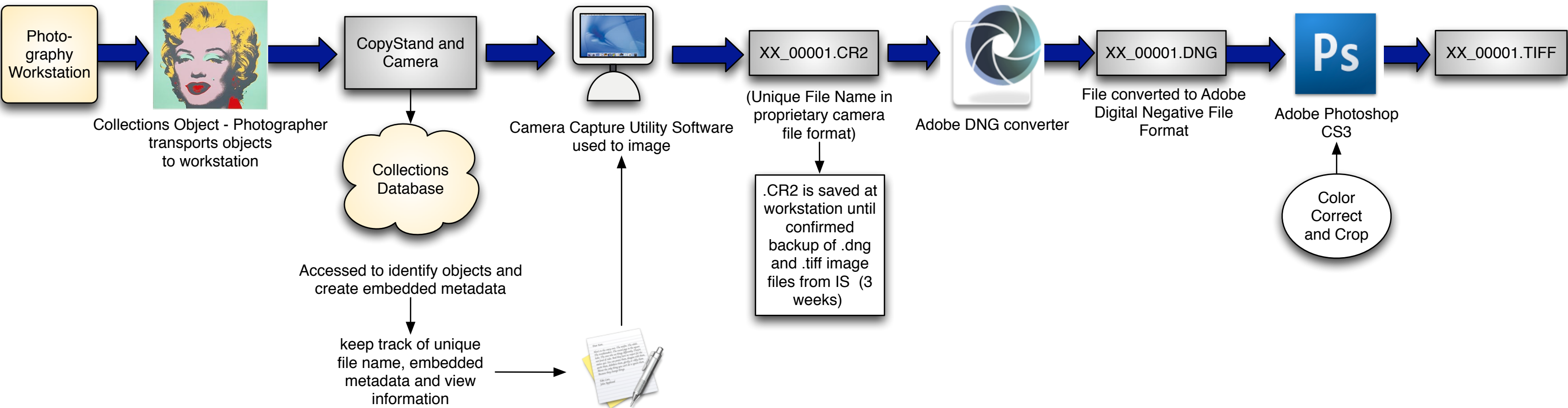
Rapid Imaging Project: Simplified Project Coordinator Workflow Chart and Archive Layout



Prospective Workflow for Simple Digital Capture

Based on the Rapid Imaging Project Workflow Charts, Karin Patzke, The Art Institute of Chicago, (05/09)

ONE: IMAGE CAPTURE:



TWO: ARCHIVE AND DISTRIBUTION OF IMAGES

